

INFORMATION SHEET

ORDER NO. R5-2005-
NPDES NO. CA0081507
SHASTA COUNTY SERVICE AREA NO. 17
COTTONWOOD WASTEWATER TREATMENT PLANT
SHASTA COUNTY

GENERAL INFORMATION

The community of Cottonwood is located in southern Shasta County approximately 15 miles south of the city of Redding, along Interstate 5. The population of Cottonwood is approximately 2960 people, based on the year 2000 U.S. Census. Cottonwood is located at an approximate elevation of 420 feet MSL and receives an average of 30 inches of rain per year.

Prior to creation of the Shasta County Service Area (CSA) No. 17, and construction of the Cottonwood Wastewater Treatment Plant, the community relied upon individual, onsite septic tank/leachfield systems. These systems were inadequate because of high groundwater elevations, high population density due to small lot sizes, and inadequate system design and maintenance. On 22 October 1976, the Regional Water Quality Control Board (Regional Board) adopted Order No. 76-230, a prohibition (after 1 January 1981) of waste discharge from individual septic tank/leachfield systems in a specified area encompassing Cottonwood. Later, Cease and Desist Order No. 82-101 was issued by the Regional Board on 23 July 1982 against the County Water District and property owners in the prohibition area. In December 1983, a Clean Water grant was awarded to the County and for construction of a wastewater treatment plant and collection system. In January 1983, the Shasta County Board of Supervisors approved the formation of County Service Area No. 17 to serve as a special district and operate the facilities. CSA No. 17 is managed through the Shasta County Department of Public Works, Special Districts. The wastewater treatment plant began operation in October 1986. The wastewater treatment plant is regulated pursuant to Waste Discharge Requirements (WDRs) Order No. 98-233, which expired on 1 December 2003, but has been administratively extended until it is renewed.

The treatment plant is located in Section 12, T29N, R4W, MDB&M, as shown on Attachment A, a part of this Order. The treatment plant is located within the Lower Cottonwood Hydrologic Sub Area No. 508.20, as depicted on interagency hydrologic maps prepared by the Department of Water Resources in August 1986. The treatment plant discharges to Cottonwood Creek approximately 5 miles upstream from its confluence with the Sacramento River. The discharge point, D001, is located at 40° 22' 40" latitude and 122° 16' 15" longitude.

Due to the primarily residential and light commercial uses in the service area, the wastewater discharged to the treatment plant is predominantly domestic. The biochemical oxygen demand, total suspended solids, and settleable solids are therefore relatively predictable. Additionally, no significant concentrations of priority pollutants or other organic compounds should be expected in the treatment plant influent or effluent.

The design flow of the wastewater treatment plant is 0.430 mgd. In 2003, the maximum daily flow rate was 0.350 mgd. In 2003, the average daily flow rate was 0.286 mgd.

The wastewater treatment plant consists of:

- A headworks (manually or automatically cleaned bar screen, and a Parshall flume with an ultrasonic level sensor);
- Two, parallel oxidation ditches with aerators;
- Two, parallel secondary clarifiers with skimmers;
- Traveling-bridge sand filter unit;
- Chlorine disinfection with chlorine gas;
- A serpentine chlorine contact chamber;
- Dechlorination by addition of sulfur dioxide;
- An outfall line and diffuser to Cottonwood Creek;
- A northern 4.3 acre-feet sludge settling basin (formerly 0.83 acre-feet);
- A southern 0.63 acre-feet sludge settling basin; and
- Four, sludge/sand drying beds.

A schematic of the treatment plant layout is shown in Attachment B. Discharge from the wastewater treatment plant is presently regulated by Waste Discharge Requirements Order No. 98-233 (NPDES No. CA0081507), adopted by the Board on 11 December 1998.

RECEIVING WATER BENEFICIAL USES

Surface Water

The Regional Board adopted a *Water Quality Control Plan, Fourth Edition, for the Sacramento and San Joaquin River Basins* (hereafter Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and describes an implementation program and policies to achieve water quality objectives for all waters of the Basin. This includes plans and policies adopted by the State Water Resources Control Board (State Board) and incorporated by reference, such as Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California. These requirements implement the Basin Plan.

The Basin Plan on page II-2.00 states that: “Existing and potential beneficial uses which currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams.” The beneficial uses of Cottonwood Creek are specifically identified in the Basin Plan. The Basin Plan identifies the following existing and potential beneficial uses for Cottonwood Creek: municipal and domestic supply (MUN); irrigation and stock watering agricultural supply (AGR); industrial process supply (PROC); industrial service supply (IND), hydropower generation (POW); water contact and noncontact recreation (REC-1 and REC-2); warm and cold freshwater habitat (WARM and COLD); cold water migration of aquatic organisms (MIGR); warm and cold water spawning, reproduction, and/or early development (SPWN); and, wildlife habitat (WILD). Upon review of the flow conditions, habitat values, and beneficial uses of Cottonwood Creek, the Regional Board finds that the beneficial uses identified in the Basin Plan for Cottonwood Creek are applicable. The Basin Plan defines beneficial uses and with respect to disposal of wastewaters states that “...disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses.”

Groundwater

Unless designated otherwise by the Regional Board, the beneficial uses of groundwater of the Central Valley Region are municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process supply.

Anti-Degradation

Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California, requires the Regional Board, in regulating the discharge of waste, to maintain high quality in surface and groundwaters of the State unless it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Board’s policies (i.e., in no circumstances can this Order allow water quality to exceed the Regional Board’s water quality objectives). The Regional Board finds that the discharge, as restricted by the prohibitions, limitations, specifications, and provisions of this Order, is consistent with Resolution No. 68-16. The impact on water quality will be insignificant.

TMDLs and 303(d) Listings

Section 303(d) of the CWA requires states to identify specific water bodies where water quality standards are not expected to be met after implementation of technology-based effluent limitations by point sources. For all 303(d) - listed water bodies and pollutants, the State Board is required to develop and adopt Total Maximum Daily Loads (TMDLs) that will specify wasteload allocations for point sources and load allocations for non-point sources, as appropriate. The United States Environmental Protection Agency (U.S. EPA) has approved the State Board’s 2002 303(d) list of impaired water bodies. This extensive list does not include Cottonwood Creek.

GROUNDWATER MONITORING

This Order does not require the Discharger to conduct groundwater monitoring. There is no current evidence to indicate that discharges from the facility pose a threat to groundwater quality. If information becomes available indicating adverse groundwater impacts attributable to discharges associated with the Discharger's activity, a groundwater investigation and subsequent monitoring may be required.

EFFLUENT LIMITS (NON-PRIORITY POLLUTANTS)

The Porter-Cologne Water Quality Control Act defines water quality objectives as "...the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area." Water quality objectives designed to protect beneficial uses and prevent nuisances are found in the Basin Plan, and may be stated in either numerical or narrative form.

Federal Regulations require that, in setting effluent limitations, the Regional Board assure that the Discharger meets the more stringent of the: 1) technology based effluent limitations found in 40 CFR Part 133; or 2) limitations developed to assure that water quality objectives are not exceeded when it is shown that there is a reasonable potential for the pollutant to cause such an exceedance. The latter requirement applies to both numeric and narrative water quality objectives.

Determining reasonable potential for pollutants other than those contained in the California Toxics Rule (CTR) is accomplished by analyzing treatment plant operations, past effluent monitoring results, and other pertinent factors. In addition, the U.S. EPA has provided guidance for the analysis of reasonable potential in their *Technical Support Document for Water Quality Based Toxics Control* (EPA/505/2-90-101) or TSD, which has been considered in this permit for developing effluent limitations for pollutants other than those in the CTR and NTR. The TSD allows the use of a mixing zone (an area in the receiving water where the concentration of pollutants may exceed the water quality objective) in the determination of reasonable potential. Outside the mixing zone, the concentration of the pollutant must be less than the water quality objective. If a mixing zone is allowed, and it is determined that the concentration of the pollutant will not exceed the water quality objective outside the mixing zone, an effluent limitation is not required. The determination whether to allow a mixing zone and the determination of an effluent limitation are pollutant specific decisions.

The following sections discuss pollutants for which there are water quality objectives to protect a specified beneficial use (excepting priority pollutants, which, in accordance with the SIP, must be addressed differently), as well as pollutants that could cause exceedance of the Basin Plan's narrative toxicity objectives. If a technology based effluent limitation is required for the pollutant, this requirement is noted. The basis for the decision whether or not to set an effluent limitation is given, as well as the rationale for the numerical value of the effluent limitation, if one is established.

a. Coliform (Total and Fecal):

Technology based effluent limitation: None

Receiving water objective: The Basin Plan states “The fecal coliform concentration [in surface waters] based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200 MPN/100 mL nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400 MPN/100 mL.” In a letter to the Regional Board dated 8 April 1999, the California Department of Health Services indicated that DHS would consider wastewater discharged to water bodies with identified beneficial uses of irrigation, contact recreation, or a drinking water source to be adequately disinfected if: 1) the wastewater receives dilution of more than 20:1; 2) the effluent coliform concentration does not exceed 23 MPN/100 mL as a 7-day median; and, 3) the effluent coliform concentration does not exceed 240 MPN/100 mL more than once in any 30 day period.

Order effluent limitation: The current effluent limit for total coliform is 23 MPN/100mL as a monthly median, and 500 MPN/100mL as a daily maximum. This effluent limit does not meet the current recommendation by DHS, nor does it guarantee that the Basin Plan receiving water objective will be met. Therefore, this proposed Order establishes an effluent limit for total coliform of 23 MPN/100mL as a 7-day median, 240 MPN/100mL may only be exceeded one time during any 30-day period, and 500 MPN/100mL as a daily maximum. Additionally, during the summer and fall seasons, a 20:1 dilution of effluent in Cottonwood Creek may not be achievable, which would potentially necessitate alternative disposal solutions or more stringent treatment and disinfection requirements. Upon completion of the Cottonwood Creek flow analysis and dilution study required by this Order, this permit may be reopened and a revised effluent limitation for coliform may be adopted. As the fecal coliform concentration of any sample is less than or equal to the total coliform concentration in accordance with the bacteriological definition of coliform and analytical detection procedures for these bacteria, this effluent limitation will implement the Basin Plan water quality objective for fecal coliform.

b. Biostimulatory Substances:

Technology based effluent limitation: None

Receiving water objective: The Basin Plan states, “Water shall not contain biostimulatory substances which promote aquatic growth or in concentrations that cause nuisance or adversely affect beneficial uses.” The primary constituents of concern for this objective are nitrogen and phosphorus.

Order effluent limitation: Although nutrients and other biostimulatory substances may be present in the discharge, no nuisance conditions such as excess algae growth are anticipated. In addition, this discharge has been occurring for many years, and there is no record in the case files of any complaints or problems with excessive aquatic growth. Neither have inspections by Regional Board staff revealed problems with algae or other aquatic growth. Therefore no effluent limitation for biostimulatory

substances is established in this permit. However, receiving water quality limitations prohibit the discharge from causing fungi, slimes, or other objectionable growths. After completion of studies on the flow and wastewater dilution available in Cottonwood Creek, this Order may be reopened and effluent limits established for nutrients, if necessary.

c. Chemical Constituents:

Technology based effluent limitation: None

Receiving water objective: At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in the following provisions of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section 64444, and Tables 64449-A (Secondary Maximum Contaminant Levels-Consumer Acceptance Limitations) and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of Section 64449. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect. At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain lead in excess of 0.015 mg/L. The Regional Board acknowledges that specific treatment requirements are imposed by state and federal drinking water regulations on the consumption of surface waters under specific circumstances. To protect all beneficial uses the Regional Board may apply limitations more stringent than MCLs.

Order effluent limitation: Examination of the results of priority pollutant testing required by the CTR, as well as general information on water quality, illustrates that there should be no exceedance of primary or secondary MCLs in Cottonwood Creek (if effluent limitations in the Order are complied with). Therefore there are no effluent limitations for any of these chemical constituents, with the exception of copper and zinc. The proposed effluent limit for copper and zinc, however, is necessitated by the reasonable potential to exceed a water quality standard for aquatic life established in the CTR or Basin Plan, rather than the objective for drinking water. Establishment of effluent limits for copper and zinc are discussed below.

d. Color:

Technology based effluent limitation: None

Receiving water objective: The Basin Plan states that "Water shall be free of discoloration that causes nuisance or adversely affects beneficial uses."

Order effluent limitation: There is no significant coloration to the discharge; therefore no effluent limitations for color have been included in the Order.

e. Dissolved Oxygen (DO):

Technology based effluent limitation: None

Receiving water objective: The Basin Plan states; “For surface water bodies outside the legal boundaries of the Delta, the monthly median of the mean daily dissolved oxygen (DO) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95th percentile concentration shall not fall below 75 percent of saturation. The DO concentration shall not be reduced below the following minimum levels at any time:

Waters designated WARM 5.0 mg/L

Waters designated COLD 7.0 mg/L

Waters designated SPWN 7.0 mg/L”

During low flow periods in Cottonwood Creek, it is possible that background DO concentrations may fall below the Basin Plan objective, however, the failure is not due to the presence of the effluent discharge. The effluent discharge should not contribute to a decrease in DO in Cottonwood Creek, however, a receiving water limitation that implements the Basin Plan objective is included in this Order.

Order Effluent Limitation: No effluent limitation has been included in this Order for DO due to the lack of reasonable potential to cause a failure of the Basin Plan objective, however, a receiving water limitation is included.

f. Biochemical Oxygen Demand (BOD):

Technology based effluent limitation: Federal Regulations, 40 CFR, Part 133, provide technology based effluent limitations for BOD. Pursuant to the regulations at 40 CFR Parts 133.105(a), (b), and 133.103, the BOD 30-day average discharge limitation for a secondary treatment system shall not exceed 30 mg/L, the 7-day average shall not exceed 45 mg/L, and the 30-day BOD percent removal shall not be less than 85 percent.

Receiving water objective: There is no Basin Plan water quality objective for BOD. However, the level of BOD in the discharge could affect dissolved oxygen concentrations in the receiving water, and in fact is the main constituent that could reduce oxygen to unacceptably low levels. But as indicated in Item e. above, the discharge will not cause a significant decrease in the dissolved oxygen in the receiving water.

Order effluent limitation: The existing permit contains BOD effluent limits that are more stringent than the technology based limits because when the discharge was first permitted, it was recognized that dilution would be limited, and advanced secondary treatment processes were included in the design of the treatment plant. The reduced BOD concentration in the discharge also ensures that the receiving water DO concentration isn't adversely affected by the discharge. The Discharger has not had difficulty in achieving the more stringent BOD effluent limit, and therefore this proposed Order continues these effluent limits as 10 mg/L as a monthly average, 15 mg/L as a weekly average, and 30 mg/L as a daily maximum.

g. Floating Material:

Technology based effluent limitation: None

Receiving water objective: The Basin Plan states, “Water shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses.” The Receiving Water Limitations in this permit prohibit floating material in amounts that exceed this Basin Plan water quality objective.

This discharge has been occurring for many years, and there is no record in the case files of any complaints or problems with excessive floating material. Neither have Regional Board staff inspections revealed problems with floating material.

Order effluent limitation: No effluent limit for floating material is established in this permit. However, receiving water quality limitations prohibit the Discharger from causing a nuisance or adversely affecting beneficial uses due to floating material.

h. Oil and Grease:

Technology based effluent limitation: None

Receiving water objective: The Basin Plan states “Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.”

The current wastewater treatment activity is not anticipated to generate any oils, greases, waxes, or other materials that can cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.

Order effluent limitation: No effluent limitation has been included in this Order due to the lack of reasonable potential for failure to achieve water quality objectives, and the lack of a technology based effluent limitation.

i. pH:

Technology based effluent limitation: From 6.0 to 9.0

Receiving water objective: The Basin Plan provides that the pH (of surface waters) shall not be depressed below 6.5 nor raised above 8.5 pH Units. The Basin Plan further provides that changes in normal ambient pH levels shall not exceed 0.5 pH Units in fresh waters with designated COLD or WARM beneficial uses.

The Report of Waste Discharge submitted by the Discharger indicates the lowest and highest pH values of 6.0 and 6.8 in the effluent, respectively. These readings indicate that the current wastewater treatment activity has a reasonable potential to generate effluent with pH values that could adversely affect beneficial uses.

Order effluent limitation: An effluent limitation for this criterion is set at 6.0 (daily minimum) and 9.0 (daily maximum), which is protective of receiving waters due to the

available (although limited) dilution in Cottonwood Creek, and complies with the technology based effluent limitation. This limit is reasonably achievable by the Discharger.

j. Pesticides:

Technology based effluent limitation: None

Receiving water objective: The Basin Plan States; “1) No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses; 2) Discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses; 3) Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the USEPA or the Executive Officer; 4) Pesticide concentrations shall not exceed those allowable by applicable antidegradation policies (see SWRCB Resolution 68-16 and 40 CFR Section 131.12.); 5) Pesticide concentrations shall not exceed the lowest levels technically and economically achievable; 5) Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of pesticides in excess of the Maximum Contaminant Levels set forth in California Code of Regulations, Title 22, Division 4, Chapter 15; and 6) Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of thiobencarb in excess of 1.0 µg/L.”

Order effluent limitation: In accordance with the California Toxics Rule, the Discharger has tested for multiple pesticides and herbicides, and none have been found to be present. Therefore there are no effluent limitations for pesticides in this Order.

k. Radioactivity:

Technology based effluent limitation: None

Receiving water objective: The Basin Plan States; “Radionuclides shall not be present in concentrations that are harmful to human, plant, animal or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal or aquatic life. At a minimum, waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the maximum contaminant levels (MCLs) specified in Table 4 (MCL Radioactivity) of Section 64443 of Title 22 of the California Code of Regulations, which are incorporated by reference into this plan. This incorporation-by-reference is prospective, including future changes to the incorporated provisions as the changes take effect.”

Order effluent limitation: No unacceptable levels of radionuclides are expected in Cottonwood Creek or in the Discharger's effluent. Therefore, no effluent limitations for radionuclides are contained in this Order.

l. Salinity:

Technology based effluent limitation: None

Receiving water objective: The Basin Plan does not specify a water quality objective for electrical conductivity (EC) in Cottonwood Creek. The Basin Plan does contain a water quality objective for EC for the portion of the Sacramento River to which Cottonwood Creek is tributary. This objective is 230 micromhos/cm as a 50th percentile.

Order effluent limitation: No data has been obtained regarding the EC level in the discharge or in Cottonwood Creek. This proposed Order requires the Discharger to obtain data on effluent and receiving water EC to confirm that water quality in Cottonwood Creek and the downstream Sacramento River will not be unacceptably impacted by EC.

m. Total Suspended Matter:

Technology based effluent limitation: Federal regulations, 40 CFR, Part 133, provides technology based effluent limitations for total suspended solids (TSS). Pursuant to the regulations at 40 CFR Parts 133.105(a), (b), and 133.103, the TSS 30-day average discharge limitation for secondary systems shall not exceed 30 mg/L, the 7-day average shall not exceed 45 mg/L, and the 30-day TSS percent removal shall not be less than 45 percent.

Receiving water objective: Regarding suspended material, the Basin Plan states: "Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses."

The current wastewater treatment process has a reasonable potential to generate suspended matter in quantities that would cause exceedance of the above narrative standard. Municipal wastewater contains suspended matter, some of which will escape the treatment and/or removal process. At times the treatment plant could discharge excessive solids due to process problems.

Order effluent limitation: The existing permit contains TSS effluent limits that are more stringent than the technology based limits because when the discharge was first permitted, it was recognized that dilution would be limited, and advanced secondary treatment processes were included in the design of the treatment plant. The Discharger has not had difficulty in achieving the more stringent TSS effluent limit, and therefore this proposed Order continues these effluent limits as 10 mg/L as a monthly average, 15 mg/L as a weekly average, and 30 mg/L as a daily maximum.

n. Temperature:

Technology based effluent limitation: None

Receiving water objective: The Basin Plan states: "The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to

the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5°F above natural receiving water temperature. In determining compliance with the water quality objectives for temperature, appropriate averaging periods may be applied provided that beneficial uses will be fully protected.”

Order Effluent Limitation: The current practice of effluent discharge is not expected to cause variation in receiving water temperature by more than 5°F. However, to ensure that the receiving water objective is protected (among other reasons), repair or replacement of the effluent diffuser in Cottonwood Creek is required by this Order. No effluent limitation has been included in this Order for temperature.

o. Toxicity:

Technology based effluent limitation: None

Receiving water objective: The Basin Plan provides that relative to toxicity: “All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances.” The potential for human toxicity from individual pollutants is addressed in each of the individual pollutant sections in this Order. The potential for toxicity to plant and aquatic life is addressed by provisions that require characterization of the discharge for chronic and acute toxicity.

Order Effluent Limitation: The Discharger is required to conduct the acute and chronic toxicity testing as specified in the Monitoring and Reporting Program. Effluent must result in survival of test fishes in 96-hour bioassays of undiluted effluent be no less than:

Minimum for any one bioassay - - - - - 70 percent
Median for any three or more bioassays - - - - - 90 percent.

If the testing indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the water quality objective for toxicity, this Order requires the Discharger to initiate a Toxicity Identification Evaluation (TIE) to identify the causes of toxicity. Upon completion of the TIE, the Discharger will submit a work plan to conduct a Toxicity Reduction Evaluation (TRE) and, after Board evaluation, conduct the TRE. This Order will be reopened and a chronic toxicity limitation included and/or a limitation for the specific toxicant identified in the TRE included. Additionally, if a chronic toxicity water quality objective is adopted by the State Board, this Order may be reopened and a limitation based on that objective included.

In addition, some compounds have been found to have a reasonable potential to exceed water quality objectives in the CTR in accordance with the SIP. The deleterious effects of these pollutants on Cottonwood Creek would primarily be due to toxicity to fish and other aquatic species. Effluent monitoring for these compounds is included in this permit as described below under “REASONABLE POTENTIAL ANALYSIS FOR CTR AND NTR CONSTITUENTS.” Chlorine and ammonia are also compounds that may cause toxicity in Cottonwood Creek. Methods of addressing potential chlorine and ammonia toxicity are described in items q. and r.

p. Turbidity:

Technology based effluent limitation: None

Receiving water objective: The Basin Plan states: “Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limitations:

- Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.
- Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.
- Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.
- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.”

Order Effluent Limitation: There may be a reasonable potential for the discharge from the treatment plant to exceed the receiving water turbidity criteria due to potential treatment process failures. Therefore, receiving water limitations have been incorporated into this Order in conformance with Basin Plan objectives. Averaging periods for compliance calculations are allowed if approved by the Executive Officer.

q. Chlorine:

Technology based effluent limitation: None

Receiving water objective: See the Basin Plan objective above under Toxicity. Chlorine can be toxic to aquatic life and has reasonable potential to be discharged at significant concentrations. The current effluent limitation for total chlorine residual is 0.1 mg/L as a daily maximum. The USEPA has developed ambient water quality criteria for chlorine to protect freshwater aquatic organisms. The USEPA’s ambient water quality criteria for protection of aquatic life are 11 µg/L as a 4-day average (chronic) concentration, and 19 µg/L as a 1-hour average (acute) concentration for total chlorine residual.

Order effluent limitation: This permit contains effluent discharge limitations for total chlorine residual of 0.01 mg/L as a 4-day average, and 0.02 mg/L as an hourly average based on the USEPA ambient criteria to protect aquatic life. Monitoring for this constituent is on a continuous basis.

r. Ammonia:

Technology based effluent limitation: None

Receiving water objective: See the Basin *Plan* objective above under Toxicity.

Ammonia concentrations in the effluent from domestic wastewater treatment plants without nitrification capabilities (conversion of ammonia to nitrate), in general, are higher than USEPA recommended freshwater criteria. Although the wastewater treatment plant is capable of nitrification, nitrification may not fully occur year-round. The toxicity of ammonia depends on such factors as fish life stages present, receiving water temperature, and receiving water pH. The USEPA has published revised ambient water quality criteria for ammonia (1999 Ammonia Update), superseding all previous USEPA recommended freshwater criteria for ammonia. The Discharger has not previously been required to monitor for ammonia in the discharge, however reasonable potential may exist for the discharge to cause the receiving water to exceed the USEPA criteria. Therefore, this Order requires the Discharger to monitor the discharge for ammonia. If monitoring indicates that the discharge has the reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan narrative toxicity objective, then this Order will be reopened and an appropriate effluent limit for ammonia will be added.

Order Effluent Limitation: This Order contains requirements for monitoring effluent ammonia, and a re-opener to set ammonia effluent limitations if it is determined that ammonia in the effluent presents a reasonable potential for exceedance of a water quality objective.

REASONABLE POTENTIAL ANALYSIS FOR CTR/NTR PRIORITY POLLUTANTS

U.S. EPA regulations at 40 CFR 122.4 (d) require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above a narrative or numerical water quality standard. The National Toxics Rule (NTR) establishes water quality criteria for toxic pollutants applicable to the Discharger at 40 CFR Part 131.36. On May 18, 2000 and by amendment on 13 February 2001, water quality criteria of the NTR were supplemented by criteria of the California Toxics Rule (CTR) at 40 CFR 131.38. The NTR, CTR, and the Basin Plan contain water quality standards applicable to the discharge.

The State Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Policy or

SIP), which contains guidance on implementation of the CTR, including the determination of reasonable potential for CTR pollutants. To determine reasonable potential for non-CTR pollutants, the Regional Board relies on methodology presented in U.S. EPA's *Technical Support Document for Water Quality Based Toxics Control* (TSD) (EPA/505/2-90-001, 1991). And, for interpretation of narrative water quality objectives, the Regional Board uses as a resource its *Compilation of Water Quality Goals* (2000).

On 27 February 2001, 12 July 2001 (for dioxin congeners only), and 11 January 2002, the Discharger collected effluent and receiving water samples for analyses of the CTR toxic priority pollutants. Analyses were performed for volatile and semi-volatile substances, metals, 2,3,7,8-TCDD dioxin, and sixteen other dioxin congeners and reported in accordance with procedures established by the SIP.

Methodology described in Section 1.3 of the SIP was used to evaluate the Discharger's monitoring data for the CTR priority toxic pollutants. No credit for dilution of the effluent with the receiving water was considered. Copper, zinc, cyanide, bromodichloromethane, chloroform, and bis-2-ethylhexylphthalate were detected at concentrations that may cause or contribute to an in-stream excursion above a numerical water quality standard of the CTR or the Basin Plan.

Final water quality based effluent limitations for copper and zinc are included in this Order, as described below. Effluent limitations for cyanide, bromodichloromethane, chloroform, and bis-2-ethylhexylphthalate are not established in this Order because insufficient information exists at this time to determine if an effluent limit is necessary for these pollutants, as discussed below. The following table summarizes the priority pollutants of concern, their corresponding water quality standards, and the maximum observed concentration in the discharge and receiving water.

| Pollutant | Most Stringent CTR Water Quality Criteria | Most Stringent Basin Plan Water Quality Objective | Maximum Observed Receiving Water or Effluent Concentration and Date Sampled |
|------------------|---|--|---|
| Copper | 8.49 ug/L chronic and 12.7 ug/L acute criteria (dissolved) for protection of freshwater aquatic life at 94 mg/L hardness as CaCO ₃ . | 12.2 ug/L (dissolved), acute objective for the Sacramento River and its tributaries above State Hwy 32 bridge at Hamilton City, at 94 mg/L hardness as CaCO ₃ . | 12 and 3.6 µg/L (total recoverable) effluent and receiving water, respectively, on 11 January 2002. |
| Zinc | 112 ug/L chronic and 111 ug/L acute criteria (dissolved) for protection of freshwater aquatic life at 94 mg/L hardness as CaCO ₃ . | 32.5 ug/L (dissolved), acute objective for the Sacramento River and its tributaries above State Hwy 32 bridge at Hamilton City, at 94 mg/L hardness as CaCO ₃ . | 52 and 18 µg/L (total recoverable) effluent and receiving water, respectively, on 11 January 2002. |
| Cyanide | 5.2 ug/L chronic and 22 ug/L acute criteria for protection of freshwater aquatic life. | 10 µg/L acute objective for the Sacramento River from Keswick Dam to the I Street Bridge in Sacramento. | 54 and 5 ug/L effluent and receiving water, respectively, on 27 February 2001. |

| Pollutant | Most Stringent CTR Water Quality Criteria | Most Stringent Basin Plan Water Quality Objective | Maximum Observed Receiving Water or Effluent Concentration and Date Sampled |
|----------------------------|--|--|---|
| | | Independent of hardness. | |
| Bromodichloromethane | 0.56 µg/L (CTR human health criteria for consumption of water and organisms) | No chemical-specific objective. 0.27 ug/L Cal/EPA (OEHHA) Cancer Potency Factor. | 3 µg/L effluent, on 11 January 2002. |
| Chloroform | No CTR criteria. | No chemical-specific objective. 1.1 ug/L Cal/EPA (OEHHA) Cancer Potency Factor. | 20 ug/L in effluent on 11 January 2002. |
| Bis-2-Ethylhexyl-phthalate | 1.8 µg/L (CTR human health criteria for consumption of water and organisms) | No chemical-specific objective. 4 µg/L California Primary MCL. | 2 and 10 ug/L effluent and receiving water, respectively, on 11 January 2002. |

Cyanide: Cyanide was detected in the effluent sample collected on 27 February 2001 at a concentration of 54 ug/L, and in the receiving water at 5 ug/L. The CTR chronic and acute criteria (independent of hardness) for the protection of freshwater aquatic life are 5.2 ug/L and 22 ug/L, respectively. The Basin Plan (Table III-1) instantaneous maximum (acute) objective is 10 ug/L, independent of hardness. Therefore, the most stringent, applicable water quality standard for cyanide is the CTR chronic criteria of 5.2 ug/L for the protection of freshwater aquatic life. The analytical laboratory that performed the cyanide analyses for the Discharger originally reported incorrect results and later issued revised results. The reported presence of cyanide in the effluent at 54 ug/L, and especially the reported presence in the receiving water is somewhat unexpected, and when considered with the laboratory reporting problems, the data is unreliable. Therefore, insufficient information exists to determine if an effluent limit for cyanide is appropriate. This Order requires the effluent to be monitored for cyanide, and if, after sufficient information has been collected, it can be determined that reasonable potential exists for the effluent to exceed a water quality standard for cyanide, this Order may be reopened and an effluent limit for cyanide added, as appropriate.

Bromodichloromethane: Bromodichloromethane was detected in the effluent sample collected on 11 January 2002 at a concentration of 3 ug/L. It was not detected in the effluent sample collected on 27 February 2001, however. The CTR human health criteria for consumption of water and organisms is 0.56 ug/L. Although the Basin Plan does not include numerical water quality criteria for bromodichloromethane, there is a narrative water quality objective of the Basin Plan for toxicity, which states that all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. To interpret this narrative objective, the Regional Board relies on its *Compilation of Water Quality Goals* (2000), which includes the Cal/EPA Cancer Potency Factor, established by the Office of Environmental Health Hazard Assessment (OEHHA), of 0.27 ug/L for bromodichloromethane. Because the health-based criteria maintained by the OEHHA are used as a basis for California state regulatory action, in accordance with the Regional Board's policy, this criterion is given preference when interpreting narrative water quality objectives. [Central Valley Regional Water Quality

Control Board, A Compilation of Water Quality Goals, at page 15 (2000)] Additionally, a California Primary MCL of 100 ug/L has been established for Total Trihalomethanes (bromoform, bromodichloromethane, chloroform, and dibromochloromethane). The Basin Plan states that, "At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs)...incorporated by reference into this plan."

The most stringent, applicable water quality standard for bromodichloromethane is the CTR Human Health criteria for consumption of water and organisms of 0.56 ug/L. The Cal/EPA Cancer Potency Factor of 0.27 ug/L should also be considered.

Trihalomethanes, comprised of the typical chlorination byproduct compounds bromoform, bromodichloromethane, chloroform and dibromochloromethane can be formed in the chlorination process at wastewater treatment plants. While it is not unexpected that trihalomethanes would be present in the effluent, insufficient information exists at this time to establish an effluent limitation. Therefore, this Order requires the effluent to be monitored for trihalomethanes, and if, after sufficient information has been collected, it can be determined that reasonable potential exists for the effluent to exceed a water quality standard for any of the trihalomethane compounds, this Order may be reopened and an effluent limit for the compound(s) added, as appropriate.

Chloroform: Chloroform was detected in the effluent samples collected on 27 February 2001 and 11 January 2002 at concentrations of 2.2 ug/L and 20 ug/L, respectively. Although the CTR does not include numerical water quality criteria for chloroform, there is a narrative water quality objective of the Basin Plan for toxicity, which states that all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. To interpret this narrative objective, the Regional Board relies on its *Compilation of Water Quality Goals* (2000), which includes the Cal/EPA Cancer Potency Factor, established by the Office of Environmental Health Hazard Assessment (OEHHA), of 1.1 ug/L for chloroform. Because the health-based criteria maintained by the OEHHA are used as a basis for California state regulatory action, in accordance with the Regional Board's policy, this criterion is given preference when interpreting narrative water quality objectives. [Central Valley Regional Water Quality Control Board, A Compilation of Water Quality Goals, at page 15 (2000)] Additionally, a California Primary MCL of 100 ug/L has been established for Total Trihalomethanes (bromoform, bromodichloromethane, chloroform, and dibromochloromethane). The Basin Plan states that, "At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs)...incorporated by reference into this plan."

The most stringent, applicable water quality standard for chloroform is the Cal/EPA Cancer Potency Factor of 1.1 ug/L.

Trihalomethanes, comprised of the typical chlorination byproduct compounds bromoform, bromodichloromethane, chloroform and dibromochloromethane can be formed in the chlorination process at wastewater treatment plants. While it is not unexpected that trihalomethanes would be

present in the effluent, insufficient information exists at this time to establish an effluent limitation. Therefore, this Order requires the effluent to be monitored for trihalomethanes, and if, after sufficient information has been collected, it can be determined that reasonable potential exists for the effluent to exceed a water quality standard for any of the trihalomethane compounds, this Order may be reopened and an effluent limit for the compound(s) added, as appropriate.

Bis-2-Ethylhexylphthalate: Bis-2-ethylhexylphthalate was detected in the effluent and receiving water samples collected on 11 January 2002 at concentrations of 2 ug/L and 10 ug/L, respectively. It was not detected in either the effluent or receiving water samples collected on 27 February 2001. The CTR Human Health Criteria for consumption of water and organisms is 1.8 ug/L. Additionally, a California Primary MCL of 4 ug/L has been established for bis-2-ethylhexylphthalate. The Basin Plan states that, "At a minimum, water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) ...incorporated by reference into this plan."

The most stringent, applicable water quality standard for bis-2-ethylhexylphthalate is the CTR Human Health criteria for consumption of water and organisms of 1.8 ug/L.

Bis-2-ethylhexylphthalate is a common contaminant of sample containers, sampling apparatus, and analytical equipment, and it is therefore possible that the contaminant is not truly present in the receiving water or effluent discharge. This Order requires the Discharger to take steps to assure that sampling containers and apparatus are not the source of this contaminant. If changes in sampling and/or analytical procedures and equipment indicate that bis-2-ethylhexylphthalate is not actually present in the effluent or receiving water samples at concentrations that trigger reasonable potential according to the SIP, then effluent limits are not necessary. If bis-2-ethylhexylphthalate continues to be detected in the effluent and/or receiving water, then this Order may be reopened and modified to include an appropriate effluent limitation for bis-2-ethylhexylphthalate.

FINAL EFFLUENT LIMITS (CTR/NTR CONSTITUENTS)

As described above, the Regional Board has performed a Reasonable Potential Analysis (RPA) to determine what priority, toxic pollutants are discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above a narrative or numerical water quality standard. Copper and zinc were detected in the effluent at concentrations that, in accordance with methodology of the SIP, may cause or contribute to an in-stream excursion above a narrative or numerical water quality standard, and therefore, effluent limits for copper and zinc are implemented in this Order, as described below.

Dilution Considerations for Effluent Limit Calculations

In determining effluent limits, the Regional Board did not allow credit for the dilution of effluent with the receiving water. Effluent limits, therefore, have been established to meet the water quality standard at the point of discharge. The Regional Board may grant a dilution credit and a mixing zone only if a sufficient study and demonstration is made that a dilution credit is appropriate and protective of receiving water beneficial uses.

Copper

Hardness. The toxicity of certain metals, including copper, increases with decreasing water hardness concentrations. On 27 February 2001, hardness in the receiving water was measured at 94 mg/L as CaCO₃, and this figure has been used to determine reasonable potential for copper. As the toxicity of copper varies with water hardness, the effluent limits established for copper in this Order also vary as a function of receiving water hardness.

Translator. U.S. EPA regulations at 40 CFR 122.45 (c) require effluent limitations for metals to be expressed as total recoverable metal, and therefore, attention must be given to ensure that analytical data and water quality standards for metals are expressed accordingly. Appendix 3 of the SIP provides conversion factors (CFs) or translators, for certain metals including copper, to convert total recoverable concentrations to dissolved concentrations and vice versa. The CF for copper is 0.960 for both acute and chronic freshwater criteria.

Water Quality Criteria or Objective and Calculation of Effluent Limitations. The CTR chronic and acute criteria for copper for the protection of aquatic life are 8.49 and 12.7 ug/L, respectively, expressed as dissolved metal (dissolved), at a receiving water hardness of 94 mg/L as CaCO₃. The Basin Plan (Table III-1) instantaneous maximum (acute) concentration for copper is 12.2 ug/L (dissolved) at 94 mg/L as CaCO₃. The Regional Board has determined that the applicable water quality standards in these circumstances are the chronic criteria from the CTR and the instantaneous maximum (acute) objective from the Basin Plan.

For each water quality standard, an effluent concentration allowance (ECA) is calculated from the following equation to account for dilution and background levels of each pollutant.

$$ECA = C + D (C - B)$$
, where C is the water quality criterion, D is the dilution credit, and B is the ambient background concentration. The ECA is also converted to total recoverable metal using the translator, as appropriate.

Because no credit for dilution is being allowed, D equals zero, and the ECA equals C. Here, $ECA_{\text{chronic}} = 8.85 \text{ ug/L}$ and $ECA_{\text{acute}} = 12.7 \text{ ug/L}$ (total recoverable metal) at a water hardness of 94 mg/L as CaCO₃.

For each ECA based on an aquatic life criterion, the long-term average discharge condition (LTA) is determined by multiplying the ECA by a multiplier, taken from Table 1 of the SIP, to account for effluent variability. LTA multipliers are determined based on a coefficient of variation (CV) and on a specified probability of occurrence. The CV is a measure of the relative variations of a set of data. In the RPA for this facility, because there were fewer than 10 data points, the CV was set equal to a default value of 0.6. The ECA multipliers for calculating LTAs at the 99th percentile occurrence probability are 0.321 (acute multiplier) and 0.527 (chronic multiplier). Here, $LTA_{\text{chronic}} = 4.66 \text{ ug/L}$, and $LTA_{\text{acute}} = 4.07 \text{ ug/L}$ (total recoverable metal) at a water hardness of 94 mg/L as CaCO₃.

Average monthly effluent limitations (AMELs) and maximum daily effluent limitations (MDELs) are calculated by multiplying the most limiting LTA ($LTA_{acute} = 4.07$) by a multiplier that accounts for averaging periods and exceedance frequencies of the effluent limitations, and for the AMEL, the effluent monitoring frequency. The CV was set equal to 0.6 and the sampling frequency was set equal to 4. A 99th percentile occurrence probability was used to determine the MDEL multiplier and a 95th percentile occurrence probability was used to determine the AMEL multiplier. From Table 2 of the SIP, the MDEL multiplier is 3.11, and the AMEL multiplier is 1.55. Final effluent limits for copper, derived from the Basin Plan (Table III-1) Instantaneous Maximum (acute) objective, are:

AMEL = 6.3 ug/L (total recoverable) at a water hardness of 94 mg/L as $CaCO_3$.

MDEL = 12.7 ug/L (total recoverable) at a water hardness of 94 mg/L as $CaCO_3$.

The final AMEL and MDEL are water hardness dependent, and therefore the AMEL and MDEL used for compliance determination are variable and must be calculated. Attachment C - Copper includes a pre-calculated table of copper AMELs and MDELs for various water hardness values.

Zinc

Hardness. The toxicity of certain metals, including zinc, increases with decreasing water hardness concentrations. On 27 February 2001, hardness in the receiving water was measured at 94 mg/L as $CaCO_3$, and this figure has been used to determine reasonable potential for zinc. As the toxicity of zinc varies with water hardness, the effluent limits established for zinc in this Order also vary as a function of receiving water hardness.

Translator. U.S. EPA regulations at 40 CFR 122.45 (c) require effluent limitations for metals to be expressed as total recoverable metal, and therefore, attention must be given to ensure that analytical data and water quality standards for metals are expressed accordingly. Appendix 3 of the SIP provides conversion factors (CFs) or translators, for certain metals including zinc, to convert total recoverable concentrations to dissolved concentrations and vice versa. The CFs for zinc are 0.978 and 0.986 for acute and chronic freshwater criteria, respectively.

Water Quality Criteria or Objective and Calculation of Effluent Limitations. The CTR chronic and acute criteria for zinc for the protection of aquatic life are 112 and 111 ug/L, respectively, expressed as dissolved metal (dissolved), at a receiving water hardness of 94 mg/L as $CaCO_3$. The Basin Plan (Table III-1) instantaneous maximum (acute) concentration for zinc is 32.5 ug/L (dissolved) at 94 mg/L as $CaCO_3$. The Regional Board has determined that the applicable water quality standards in these circumstances are the chronic criteria from the CTR and the instantaneous maximum (acute) objective from the Basin Plan.

For each water quality criterion, an effluent concentration allowance (ECA) is calculated from the following equation to account for dilution and background levels of each pollutant.

$ECA = C + D (C - B)$, where C is the water quality criterion, D is the dilution credit, and B is the ambient background concentration. The ECA is also converted to total recoverable metal using the translator, as appropriate.

Because no credit for dilution is being allowed, D equals zero, and the ECA equals C. Here, $ECA_{\text{chronic}} = 114 \text{ ug/L}$ and $ECA_{\text{acute}} = 33.3 \text{ ug/L}$ (total recoverable metal) at a water hardness of 94 mg/L as CaCO_3 .

For each ECA based on an aquatic life criterion, the long-term average discharge condition (LTA) is determined by multiplying the ECA by a multiplier, taken from Table 1 of the SIP, to account for effluent variability. LTA multipliers are determined based on a coefficient of variation (CV) and on a specified probability of occurrence. The CV is a measure of the relative variations of a set of data. In the RPA for this facility, because there were fewer than 10 data points, the CV was set equal to a default value of 0.6. The ECA multipliers for calculating LTAs at the 99th percentile occurrence probability are 0.321 (acute multiplier) and 0.527 (chronic multiplier). Here, $LTA_{\text{chronic}} = 59.9 \text{ ug/L}$, and $LTA_{\text{acute}} = 10.7 \text{ ug/L}$ (total recoverable metal) at a water hardness of 94 mg/L as CaCO_3 .

Average monthly effluent limitations (AMELs) and maximum daily effluent limitations (MDELs) are calculated by multiplying the most limiting LTA ($LTA_{\text{acute}} = 10.7$) by a multiplier that accounts for averaging periods and exceedance frequencies of the effluent limitations, and for the AMEL, the effluent monitoring frequency. The CV was set equal to 0.6 and the sampling frequency was set equal to 4. A 99th percentile occurrence probability was used to determine the MDEL multiplier and a 95th percentile occurrence probability was used to determine the AMEL multiplier. From Table 2 of the SIP, the MDEL multiplier is 3.11, and the AMEL multiplier is 1.55. Final effluent limits for zinc, derived from the Basin Plan (Table III-1) Instantaneous Maximum (acute) objective, are:

AMEL = 16.5 ug/L (total recoverable) at a water hardness of 94 mg/L as CaCO_3 .

MDEL = 33.2 ug/L (total recoverable) at a water hardness of 94 mg/L as CaCO_3 .

The final AMEL and MDEL are water hardness dependent, and therefore the AMEL and MDEL used for compliance determination are variable and must be calculated. Attachment D - Zinc includes a pre-calculated table of zinc AMELs and MDELs for various water hardness values.

INTERIM EFFLUENT LIMITS (CTR/NTR CONSTITUENTS)

In accordance with the Regional Board's *Policy for Application of Water Quality Objectives*, presented in Chapter IV of the Basin Plan, schedules for compliance with final effluent limitations, which are based on water quality criteria adopted before 25 September 1995, cannot be authorized. Here, as final effluent limitations for copper and zinc are based on water quality criteria of the Basin Plan adopted before 25 September 1995, a compliance schedule and interim limits have not been considered, and final limitations for copper and zinc will become immediately effective upon adoption of this Order. However, the Regional Board may adopt other Orders, such as a Cease and

Desist Order, allowing the Discharger a period of time to fully comply with the effluent limits for copper and zinc.

FLOW RATE LIMITATION

The monthly average daily dry weather flow limitation of 0.43 mgd is based on the design capacity of the treatment facility and is consistent with the previous permit.

SLUDGE DISPOSAL

This Order requires the Discharger to develop and implement a Sludge Management and Disposal Plan to assure proper handling and disposal of solids that are collected and/or generated at the wastewater treatment plant. The Discharger is required to report any proposed change in sludge use or disposal practice 90 days in advance of change.

RECEIVING WATER LIMITATIONS

The receiving water limitations contained in this proposed Order are based on protecting the beneficial uses identified in the Basin Plan for Cottonwood Creek.

OTHER ISSUES OF CONCERN

Underdrain System

The wastewater treatment plant was installed with an underdrain system to maintain separation between the bottom of the treatment works and groundwater. The underdrain system discharges offsite to a drainage swale east of the facility. In approximately March 2002, discharge from the underdrain system appeared to increase. In addition to a dropping water level in the north sludge storage basin, this led to the discovery of leaks in at least the north (if not also the south) SSB. The north SSB has been replaced, as described below. Samples from the underdrain discharge were collected and analyzed for total and fecal coliform bacteria. High levels of fecal coliform were detected discharging offsite. In order to determine if replacement of the north SSB has adequately mitigated the elevated fecal coliform concentrations discharged from the underdrain system, this Order requires the Discharger to sample the discharge from the underdrain system and analyze it for total and fecal coliform bacteria at a frequency of once per month, when discharge from the underdrain system is occurring. If the fecal coliform concentration in the underdrain system discharge exceeds 200 MPN/100mL (based on the Basin Plan's REC-1 water quality objective of 200 MPN/100mL as a 30-day geometric mean and a 10 percent maximum of samples exceeding 400 MPN/100mL), then this Order requires the monitoring frequency to be increased to weekly. If, after sufficient information is collected, it is determined that the discharge threatens to cause an exceedance of the Basin Plan's REC-1 water quality objective for fecal coliform in the underdrain receiving water, this Order may be reopened and limitations added, as appropriate. Alternatively, a Cease and Desist Order could be adopted to require the Discharger to eliminate the discharge or reduce the fecal coliform concentration to an acceptable level. The Regional Board has proposed, but not yet approved, a Basin Plan amendment to change the REC-1 water quality objective for

bacteria from the Fecal Coliform indicator to the E. Coli indicator. If this proposed Basin Plan amendment is implemented during the term of this Order, the Discharger may be required to conduct additional monitoring for the new indicator organism.

Sludge Storage Basins (SSBs)

As stated above, in approximately March 2002, the north sludge storage basin (SSB) was detected to be leaking. The north SSB was replaced by the end of December 2002. The new north SSB is underlain by a 1-foot thick compacted clay liner under a base of 3-inch thick asphalt concrete with 3-inch thick shotcrete sides and an access ramp. The original capacity of the north SSB was 0.83 acre-feet, the new capacity is 4.3 acre-feet. The original south SSB is now empty, as it is also suspected of leaking. The expanded north SSB has sufficient capacity to handle the current treatment plant design flow. However, the south SSB may need to be repaired in order to provide redundancy and allow the north SSB to be periodically taken offline for maintenance, etc.

Dilution/Mixing in Cottonwood Creek and Streamflow Measurement

The summer and fall flow in Cottonwood Creek provides somewhat limited dilution to the treatment plant effluent discharge. Dilution in the winter and spring is adequate. The Implementation section of the Basin Plan states that the direct discharge of wastes to streams with "intermittent flow or limited dilution capacity" is "inappropriate as a permanent disposal method". Accurate low flow measurements of the receiving water streamflow are needed to ensure that adequate dilution of the effluent is occurring in the receiving water. The existing Cottonwood Creek streamflow gage is located downstream of the discharge location and requires frequent maintenance/calibration to provide reliable low flow information. This Order requires the Discharger to monitor and report the daily average flow in the receiving water. In order to ensure that the daily average flow data is immediately available to the Discharger, the Discharger may need to make arrangements with or enter into agreements with the operator of the gage. Alternatively, the Discharger may elect to install and operate its own streamflow gage. Accurate low flow data for Cottonwood Creek in the vicinity of the discharge is required in order to determine available dilution and determine if the discharge is in compliance with the Basin Plan and other guidance. If the Discharger chooses to do a dilution and mixing zone study, adequate flow information will also be required.

In determining effluent limits, the Regional Board did not allow credit for the dilution of effluent with the receiving water. Effluent limits, therefore, have been established to meet the water quality standard at the point of discharge ("end-of-pipe"). The Regional Board may grant a dilution credit and a mixing zone only if a sufficient study and demonstration is made that a dilution credit and mixing zone is appropriate and protective of receiving water beneficial uses.

Broken Diffuser

The effluent diffuser located in Cottonwood Creek has been damaged. Reportedly, it is not currently providing any diffusion function. This Order requires the Discharger to repair or replace the diffuser, to the original design specifications. Improvements to the original design may be required in order to address shifting streambed conditions.

Chlorination/Dechlorination Equipment

The chlorination and dechlorination chemical feed controls at the wastewater treatment plant are designed to be automatically paced based on flow or concentration. Currently, the equipment is not functioning and the chemical dosing equipment is set manually. Manual operation of this equipment is not in accordance with the original plant design, and threatens to cause an effluent violation due to over- or under-dosing. This Order requires the Discharger to repair or replace this equipment.

Chronic Toxicity

The Discharger is currently required to analyze effluent samples for chronic toxicity once per year. Some of these analyses have documented adverse effects to the test organisms in the presence of the effluent. However, the most recent chronic toxicity analysis indicated no adverse effects to the test organisms. This Order continues the annual testing frequency for chronic toxicity. If additional information indicates that the discharge threatens to cause chronic toxicity in the receiving water, then the Discharger may be required to conduct a Toxicity Identification Evaluation (TIE) and Toxicity Reduction Evaluation (TRE). Additionally, this Order may be reopened and an effluent limit for the constituent(s) causing the toxicity added, as appropriate.

Houseboat Wastewater Dump Station

Due to State and Federal requirements, the houseboating industry on the nearby Lake Shasta is developing alternatives for the disposal of wastewater (gray water and black water) from the houseboats' holding tanks. One alternative is to haul wastewater to a local wastewater treatment plant for disposal. The Discharger has expressed interest in accepting this waste at the Cottonwood Wastewater Treatment Plant via a dump station. The houseboat wastewater would be expected to exhibit higher strength characteristics compared to ordinary domestic wastewater, and would also contain various odor control chemicals typically used in wastewater holding tanks. It has not been determined if the wastewater treatment plant would be capable of adequately treating such wastewater. Considering the challenges currently facing the wastewater treatment plant, including new effluent limits, the underdrain system, the south sludge storage basin, dilution and stream flow issues, broken diffuser, inoperable chlorination/dechlorination equipment, and chronic toxicity issues, it would be inappropriate to allow any new, large discharge from outside the current service area, even if it could be shown that all contaminants in the houseboat wastewater could be adequately treated/removed by the wastewater treatment plant. Therefore, this Order specifically prohibits the Discharger from accepting wastewater from sewage holding tanks, unless prior authorization is granted by the Executive Officer of the Regional Board, or his designee.

PERMIT REOPENER

If after a review of any monitoring results, it is determined that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above an applicable water quality standard, this Order may be reopened and limitations based on those objectives included. Additionally, if pollutants are detected in discharges from the Discharger's facility, but insufficient information exists to establish an effluent limit or determine if an effluent limit is necessary, then additional monitoring will be required to provide sufficient information.

The Discharger may conduct studies pertaining to facility operations, the effluent discharge, and the receiving water. For example, such studies may include a site-specific metals translator study, or a mixing zone and dilution study. If requested, the Regional Board will review such studies and if warranted, will reopen this permit to make appropriate changes.

PROCEDURES ON REACHING FINAL DECISION ON DRAFT PERMIT

The tentative waste discharge requirements have been sent to the Discharger and interested parties for review (at least 30 days) prior to formal presentation to the Regional Board. Any contested items on the permit will be heard and considered for change prior to formal adoption at the Board Meeting.

FOR FURTHER INFORMATION

For further information or questions regarding the NPDES permit, contact Bryan J. Smith at the Regional Water Quality Control Board in Redding at (530) 226-3425, bsmith@waterboards.ca.gov, or at 415 Knollcrest Dr, Suite 100, Redding, CA, 96002.

BJS
01/19/2005